

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/40117

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : C08K 5/5393, 5/53, 5/52, 5/527, 5/526, 5/524

US CL : (see electronic search)

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : (see electronic search)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
Please See Continuation Sheet

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 1,398,133 (LESLIE et al.) 18 June 1975 (18.06.1975), page 3, lines 5, 11-13, page 4, lines 17-41, Table 2.	12,14,15
Y		1-3,14,15
Y	US 6,329,493 B1 (EL-HIBRI et al.) 11 December 2001 (11.12.2001), column 3, lines 33-46, column 8, lines 60-61.	1-3,12-15
Y	US 5,164,466 A (EL-HIBRI et al.) 17 November 1992 (17.11.1992), column 3, lines 12-25, column 6, lines 47-59.	1-3,12-15
A	SU 952,923 (MILITSKOVA et al.) 23 August 1982 (23.08.1982), as evidenced by USPTO obtained translation.	
A	US 5,086,130 A (DICKINSON et al.) 4 February 1992 (04.02.1992).	
A	US 4,902,836 (KISSINGER) 20 February 1990 (20.02.1990).	

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

12 April 2004 (12.04.2004)

Date of mailing of the international search report

06 MAY 2004

Name and mailing address of the ISA/US

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## Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claim Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claim Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☒ Claim Nos.: 4-11  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:  
Please See Continuation Sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
  2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
  3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
  4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
- Remark on Protest ☐ The additional search fees were accompanied by the applicant's protest.  
☐ No protest accompanied the payment of additional search fees.

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## BOX II. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claim(s) 1-3, 14, and 15 drawn to formulations requiring (a) a weight plurality of a polysulfone having more than half mole fraction of recurring units formed by reacting 4,4'-biphenol with a sulfone monomer, (b) more than 0.01 weight percent of an organic phosphite or organic phosphonite, and (c) a polysulfone having more than half mole fraction of recurring units formed by reacting bisphenol A with a sulfone monomer; and articles formed therefrom.

Group II, claim(s) 12, 14, and 15, drawn to a formulation having at least 60 weight percent of a polysulfone having more than half mole fraction of recurring units formed by reacting 4,4'-biphenol with a sulfone monomer and having a melt viscosity ratio at 410C. below 1.20 at a shear rate of 50 per second; and articles formed therefrom.

Group III, claim(s) 13-15, drawn to process of formulating a polysulfone as set forth in Group I by mixing them in the molten state; and articles formed therefrom.

The inventions listed as Groups I, II, and III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The common technical feature is the formulation of Group II. Leslie et al. (GB 1398133) discloses several polysulfones of which formula IV (page 3, lines 11-14) appears to be formed from 4,4'-biphenol monomer and further suggests additives (page 4, lines 21-41) of which several would be expected to improve the melt stability, as evidenced in Table 2 where 0.1 and 0.2 weight percent of various phosphites extend the melt stability. Since the formulation of Group II is at least suggested by the reference, it is not considered a special technical feature.

## Continuation of B. FIELDS SEARCHED Item 3:

EAST, US: 525/534 and polysulfone and (biphenol or dihydroxybiphenyl or PPDP) and (bisphenol or biphenyldiol or hydroxyphenyl); 524/117, 118, 120, 126, 128, 129, 135, 149, 150, 151 and polysulfone and (bisphenol or biphenyldiol or hydroxyphenyl) and (phosphite or phosphonite);

EAST, EPO+JPO+DERWENT+IBMTDB: polysulfone and (phosphite or phosphonite)